

**STATEMENT OF WORK FOR
LIGHTNING DATA ACQUISITION**

JULY 18 2003

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LIST OF ACRONYMS

ADAS AWOS/ASOS Data Acquisition System
AFS Alaska Fire Service
ALDARS ... Automated Lightning Detection and Reporting System
ARTCC Air Route Traffic Control Center
ASOS Automated Surface Observing System
AWOS Automated Weather Observing System

BIA Bureau of Indian Affairs
BLM Bureau of Land Management

CL Cloud Lightning
CG Cloud to Ground Lightning
COTR Contracting Officers Technical Representative

DOA Department of Agriculture
DOC Department of Commerce
DOD Department of Defense
DOI Department of Interior
DOT Department of Transportation

ETMS Enhanced Traffic Management System

FAA Federal Aviation Administration
FWS Fish and Wildlife Service

IL Integrated Lightning
ITWS Integrated Terminal Weather System

km Kilometers

NASA National Aeronautics and Space Administration
NCDC National Climatic Data Center
NESDIS ... National Environmental Satellite, Data and Information
 Service
NIFC National Interagency Fire Center
NOAA National Oceanic and Atmospheric Administration
NPS National Park Service
NWS National Weather Service
NWSTRG National Weather Service Telecommunication Gateway

SOW Statement of Work

TRACON ... Terminal Radar Control Facility

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LIST OF ACRONYMS

US United States

USFS United States Forest Service

VNTSC Volpe National Transportation Systems Center

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1. INTRODUCTION

The Federal Government continues to use lightning data in its present operations and to explore new ways of using lightning data in concert with complementary data from other sources.

1.1 BACKGROUND

Several Federal Government agencies have purchased lightning data from a contractor since 1991. The National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce (DOC) has administered this contract for itself and on behalf of the other agencies. The Federal Government will continue to purchase lightning data and NOAA will continue to administer the contract. As in the past, several other government agencies receive lightning data under this contract. The use of the data by NOAA and the other agencies is described in Section 1.5.1. The number of organizations receiving lightning data could increase or decrease under the new contract. Additional organizations could include Federal Government agencies not having received data in the past as well as non-Federal agencies or contractors who provide mission support to Government agencies.

1.2. SCOPE

This Statement of Work (SOW) describes the Government's base requirement and optional services for the continued acquisition of lightning data and the methodology for its delivery to Government agencies. Also described are the uses of lightning data received by the Government, Government plans for archiving data, and the redissemination of data by the Government.

1.3. TYPES OF LIGHTNING

This SOW addresses two types of lightning; cloud to ground lightning (CG) and Cloud lightning (CL). These lightning types are defined below. These definitions will apply throughout this SOW.

1. CG lightning is lightning originating in a cloud and striking the ground or some natural or man-made feature on the ground. CG lightning in this SOW refers to either a flash or stroke. A stroke is a leader and the return stroke and subsequent strokes. A flash is the combination of one or more strokes.
2. CL is lightning not striking the ground. It includes in-cloud, cloud to cloud, and cloud to air Lightning. CL lightning in this SOW refers to the mapping of the lightning channel.

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This SOW also uses the term integrated lightning (IL), which includes both types of lightning (CG and CL).

1.4. TYPES OF LIGHTNING DATA

This SOW addresses five types of lightning data; Levels I, II, III, IV, and V. These lightning types are defined below. These definitions will apply throughout this SOW.

1. Level I Data - Streaming data as received from the offeror, unaltered in anyway.

EXAMPLE -- Streaming data received from the offeror

2. Level II Data - Offeror generated products containing lightning data.

Examples - Time-lapse loop of detected lightning

Lightning data overlaid on a radar image

3. Level III Data - Government generated products repackaging lightning data. The data is unchanged in content but is formatted differently than the Level I data. No data other than lightning data is included in the product but the entire Level I data stream need not be included in a Level III product.

Examples - Current NOAAPORT one-minute product

- Time-lapse loop of detected lightning

4. Level IV Data - Government generated value-added products which integrate lightning data along with other types of data to generate a new product. The new product identifies detected lightning or areas of lightning.

Examples - Lightning data overlaid on a satellite image

- Map outlining areas of detected lightning along with wildland fire potential.

5. Level V Data - Government generated products using lightning data as an input but not displaying detected lightning or areas of lightning.

Examples - Map of detected thunderstorms that does not

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display lightning data

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- Map of forecast thunderstorm probability that uses lightning data as an input

1.5. LIGHTNING DATA USERS

This section addresses data use by the agencies covered by this SOW. Current users and possible additional future users are also discussed. Section 1.5.1. addresses Federal Government users and Section 1.5.2. users outside the Federal Government.

1.5.1. FEDERAL GOVERNMENT USERS

Several Federal Government users currently receive lightning data and may continue to receive data in the future. Sections 1.5.1.1. through 1.5.1.6 address these users. Section 1.5.1.7. addresses possible additional future Federal Government users. These sections also address some of the uses of the data by the Federal Government agencies. Other uses not yet identified are also possible.

1.5.1.1. DEPARTMENT OF COMMERCE

DOC's NOAA uses lightning data. NOAA lightning data users include the National Weather Service (NWS), National Environmental Satellite, Data and Information Service (NESDIS) and the NOAA research organizations.

NOAA ingests lightning data into its AWIPS to support its operational mission of issuing accurate and timely meteorological and hydrological warnings, watches, forecasts and other products. NOAA also uses lightning data for research purposes to improve meteorological and hydrological forecasts and warnings. Lightning data acquired under this SOW will be integrated with other data sets to produce new products and applications.

NOAA may also archive lightning data. See Sections 6 and 7.7.2 for details on this archiving.

1.5.1.2. DEPARTMENT OF DEFENSE

Department of Defense (DOD) lightning data users include the Army, Navy, Air Force, and Marine Corps. Lightning is an important factor in safe air and land operation.

The DOD uses lightning data to support aircraft operations including pre-flight planning and pilot briefing, flight line maintenance, aircraft fueling, aircraft arming safety, and in-flight safety. Lightning data is also used to provide for safe munitions handling and storage, protect communications, protect

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troops, and protect assets during testing. Lightning data is one factor considered when issuing warnings to military bases. These warnings are for the protection of personnel and facilities.

1.5.1.3. DEPARTMENT OF TRANSPORTATION

The Department of Transportation's (DOT) Federal Aviation Administration (FAA) uses lightning data.

Lightning data is entered into the Enhanced Traffic Management System (ETMS) at the Volpe National Transportation Systems Center (VNTSC). The FAA Regions, Air Route Traffic Control Centers (ARTCC), selected Air Traffic Control Towers, Terminal Radar Control Facilities (TRACON), and Air Traffic Control Systems Command Center (ATCSCC) receive lightning data through the ETMS.

Lightning data is an input into the AWOS/ASOS Data Acquisition System (ADAS). The ADAS then enters the data into the Automated Lightning Detection and Reporting System (ALDARS). The ALDARS provides thunderstorm information to the Automated Weather Observing System (AWOS) and Automated Surface Observing System (ASOS). The ADAS also enters lightning data into the Integrated Terminal Weather System (ITWS) which is used to create terminal weather products for use of air traffic managers.

The FAA uses lightning data to increase aviation safety both en-route and in the terminal areas, to aid in the efficient movement of aircraft and to determine if thunderstorms are occurring at the AWOS/ASOS observation sites.

1.5.1.4. DEPARTMENT OF INTERIOR

Several Department of Interior (DOI) agencies receive and use lightning data. These agencies include the Bureau of Land Management (BLM), National Park Service (NPS), Fish and Wildlife Service (FWS), and Bureau of Indian Affairs (BIA). The BLM is the lead agency for the DOI. Lightning data for Zone 1 (see section 4.1.1 and Appendix B for a description of Zone 1) is received at the National Interagency Fire Center (NIFC) located in Boise, Idaho. From there it is disseminated to the other DOI agencies and the United States Forest Service (USFS).

The BLM may also receive data at the Alaska Fire Service (AFS) in Fairbanks, Alaska. Data will be disseminated from the AFS site in Fairbanks to field sites in Alaska.

The DOI agencies use lightning data to aid in locating potential wildland fires, to aid in suppressing those fires, and to support research into wildland fires and wildland fire suppression.

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The DOI plans to disseminate lightning data to state and local government wildland fire suppression agencies.

1.5.1.5. DEPARTMENT OF AGRICULTURE

The USFS, a Department of Agriculture (DOA) agency, is a part of the wildland fire community and receives lightning data from the NIFC. The USFS uses lightning data in the same manner as the DOI wildland fire agencies.

1.5.1.6. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The National Aeronautics and Space Administration (NASA) uses lightning data to support its operations and for research purposes.

NASA uses lightning data to support its ground operations such as the testing of spacecraft and propellents and to support space craft launch and recovery operations. Lightning data is used to support space shuttle operations; including launch, reentry, landing, and transport.

NASA also conducts research involving lightning data from space, sub-orbital platforms and at the earth surface.

1.5.1.7. OTHER FEDERAL GOVERNMENT USERS

Other Federal Government agencies not included in this SOW and not currently receiving lightning data may be interested in receiving data sometime during the period of performance of this SOW. The offeror will make service available to these agencies using the task order format described in Appendix D. The initial task orders for the agencies participating in this SOW are included in Addendum 1.

1.5.2. NON-FEDERAL GOVERNMENT USERS

1.5.2.1. STATE AND LOCAL GOVERNMENT USERS

Several state and local government users cooperate with the Federal Government agencies receiving lightning data. These agencies may receive Level I, II, III, IV, or V lightning data under this SOW. The data may be received from the sponsoring Government agency or directly from the offeror. The Federal Government will identify to the offeror all state and local government agencies requiring lightning under this SOW.

1.5.2.2. NON-GOVERNMENT USERS

There are also non-government organizations cooperating with Federal Government agencies receiving lightning data. These include cooperating organizations and contracting entities.

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Cooperating organizations are organizations with a cooperative working relationship with one or more Government agencies. Contracting entities are organizations that have contracts with one or more of the sponsoring agencies to perform a tasks for the Government. The tasks may involve operational use of lightning data or research. Cooperating organizations and contracting entities may receive Level I, II, III, IV, or V lightning data under this SOW. The data may be received from the sponsoring Government agency or directly from the offeror. The Government will identify to the offeror all cooperating organizations and contracting entities receiving lightning data.

Third party contractors may receive lightning data under this SOW. Third party contractors are contractors that receive lightning data and retransmit it to Federal Government agencies covered by this SOW. A third party contractor may also generate Level III, IV or V lightning data and transmit them to Federal Government agencies. Third party contractors are not lightning data users. They act only as communication companies or companies that generate Level III, IV or V lightning data for Federal Government agencies.

Example - A company receives Level I lightning data from the offeror. The company then generates Level III data and transmits them to a Federal Government agency.

1.5.3. UNAUTHORIZED USERS

There are two types of users not authorized to receive lightning data under this SOW:

1. Organizations not having a working relationship with a Federal Government user.
2. Organizations, including government agencies, using the data for any commercial purpose.

1.6 DOCUMENT ORGANIZATION

This SOW is divided into seven sections.

Section 1 -- Introduction ... Background information, definition of lightning types, information on users

Section 2 -- Services Rendered ... Required services and options to be provided by the offeror

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- Section 3 -- Technical Requirements ... Lightning data technical requirements
- Section 4 -- Geographic Coverage Requirements ... Geographic coverage zones and areal coverage options
- Section 5 -- Level II, III IV, and V Lightning Data ... Description of Government and offeror-generated Level II, III, IV, and V lightning data
- Section 6 -- Archived Data ... Description of the Government's and offeror's archive for lightning data.
- Section 7 -- Data Delivery ... Data delivery methods, receiver and user sites, receiver site equipment, data format, availability and reliability, and redistribution rights

In addition there are six appendices and one Addendum

Appendix A - Terms of Reference

Appendix B - Geographic Coverage Maps

Appendix C - Service Rendered by the Lightning Data Offerer

Appendix D - Example of a Task Order Offerer

Appendix E - Receiver and user Sites

Appendix F - Data Formats Used with the One Minute NOAAPORT Product

Addendum 1 - Initial Task Orders

2. SERVICES RENDERED

The offeror shall offer lightning data to meet the Government's basic requirement. Optional services will also be offered as specified herein. The offeror shall have a network in place to meet the basic requirement but need not have a network to meet any optional services that the Government does not request. However, if an optional service is requested the offeror must be able to meet the requirement within a period of one year from the date it receives the request.

2.1. BASE REQUIREMENT

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The offeror shall deliver CG Level I lightning data for Zone 1 (See Section 4.1.1 and Appendix B for a description of this geographic zone). This is considered the base requirement which the offeror must meet to be compliant with this SOW. The Government will procure the base requirement from the offeror, although not all agencies may choose to receive this base service.

2.2. OPTIONS BEYOND THE BASE REQUIREMENT

The offeror shall provide several optional services beyond the base requirement. These options are based on the type of lightning data (CG, CL, and IL), Levels of data (I or II), and the geographic areas covered. The offeror shall have available the specified type of lightning data from each geographic area for each option.

There are also several options for offeror supplied software and hardware, archived data, and communications described in this SOW.

The Government may or may not require the services indicated in these options. Some Government agencies may require the services indicated with one or more options while other agencies may not. Each Government agency will decide if it needs the service indicated in each option. The offeror shall be able to supply the service in individual options to individual agencies. Appendix C outlines these options and Appendix D shows an example of a task order.

3. TECHNICAL REQUIREMENTS

The offeror shall supply lightning data meeting the technical requirements described in all subsections below.

3.1. LIGHTNING DETECTION NETWORK

The offeror shall maintain and operate a lightning detection network capable of meeting the requirements in this SOW. The offeror shall maintain and operate its lightning detection network 24 hours a day 7 days a week. Lightning data from geographic Zones 1, 2 and 3 shall be made available to the Government in one minute or less. Data from the other geographic zones shall be available in 5 minutes or less. The offeror shall propose the network required to meet the base requirement and options as specified herein.

3.1.1. GEOGRAPHIC COVERAGE OF OFFERER'S NETWORK

At a minimum the network shall provide coverage for Zone 1. The offeror shall also maintain a lightning detection network

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covering any other geographic zones for which the Government has requirements. These zones are described in Section 4.1 and Appendix B.

3.2. LIGHTNING DATA REQUIREMENTS

The offeror shall supply lightning data in real-time that meets all requirements outlined in Tables 3-1 through 3-8. Refer to all subsections of 4.1 for a discussion of the geographic zones.

PARAMETER	REQUIREMENT
Location Accuracy	1 km for 99% of the area within the zone; the location of a CG flash is the location where it strikes the ground
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	90% or higher over the 48 contiguous states; 60% or higher over adjacent marine and land areas
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CG flashes shall be due to other types of lightning
Polarity	Polarity (positive or negative) shall be reported for all flashes
Estimated Peak Current	Peak current in amperes shall be reported for all flashes
Strokes per Flash	Number of strokes per flash shall be reported for all flashes
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be one minute or less for 99% of all flashes

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TABLE 3-1
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONE 1
CLOUD TO GROUND LIGHTNING (CG)

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PARAMETER	REQUIREMENT
Location Accuracy	5 km or better for 99% of the area within the zones; the location of a CG flash is the location where it strikes the ground
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	80% or higher
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CG flashes shall be due to other types of lightning
Polarity	Polarity (positive or negative) shall be reported for all flashes
Estimated Peak Current	Peak current in amperes shall be reported for all flashes
Strokes per Flash	Number of strokes per flash shall be reported for all flashes
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be one minute or less for 99% of all flashes

TABLE 3-2
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONES 2 AND 3
CLOUD TO GROUND LIGHTNING (CG)

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PARAMETER	REQUIREMENT
Location Accuracy	5 km or better for 99% of the area within the zones; the location of a CG flash is the location where it strikes the ground
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	60% or higher
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CG flashes shall be due to other types of lightning
Polarity	Polarity (positive or negative) shall be reported for all flashes
Estimated Peak Current	Peak current in amperes shall be reported for all flashes
Strokes per Flash	Number of strokes per flash shall be reported for all flashes
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be 5 minutes or less for 99% of all flashes

TABLE 3-3
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONES 4 THROUGH 15
CLOUD TO GROUND LIGHTNING (CG)

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PARAMETER	REQUIREMENT
Location Accuracy	Offeror shall propose a location accuracy to the Government
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	20% or higher
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CG flashes shall be due to other types of lightning
Polarity	NA
Estimated Peak Current	Peak current in amperes shall be reported for all flashes
Strokes per Flash	Number of strokes per flash shall be reported for all flashes
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be 5 minutes or less for 99% of all flashes

TABLE 3-4
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONES 16 THROUGH 26
CLOUD TO GROUND LIGHTNING (CG)

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PARAMETER	REQUIREMENT
Location Accuracy	Offeror shall propose a location accuracy to the Government
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	Offeror shall offer options for detection efficiencies of 5%, 10%, 20%, 50% and 90% or higher
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CL flashes shall be due to CG lightning or noise
Polarity	NA
Estimated Peak Current	NA
Strokes per Flash	NA
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be one minute or less for 99% of all flashes

TABLE 3-5
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONE 1
CLOUD LIGHTNING (CL)

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PARAMETER	REQUIREMENT
Location Accuracy	Offeror shall propose a location accuracy to the Government
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	Offeror shall offer options for detection efficiencies of 5%, 10%, 20%, and 60% or higher
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CL flashes shall be due to CG lightning or noise
Polarity	NA
Estimated Peak Current	NA
Strokes per Flash	NA
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be one minute or less for 99% of all flashes

TABLE 3-6
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONES 2 AND 3
CLOUD LIGHTNING (CL)

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PARAMETER	REQUIREMENT
Location Accuracy	Offerorshall propose a location accuracy to the Government
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	Offerorshall offer options for detection efficiencies of 5%, 10%, 20%, and 60% or higher
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CL flashes shall be due to CG lightning or noise
Polarity	NA
Estimated Peak Current	NA
Strokes per Flash	NA
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be 5 minutes or less for 99% of all flashes

TABLE 3-7
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONES 4 THROUGH 15
CLOUD LIGHTNING (CL)

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PARAMETER	REQUIREMENT
Location Accuracy	Offeror shall propose a location accuracy to the Government
Timing Accuracy	Accuracy of the reported time of flashes shall be 0.001 seconds or better
Detection Efficiency	Offeror shall offer options for detection efficiencies of 5%, 10%, 20% or higher
Probability of False Detection	No more than 1% of all reported lightning flashes shall be due to non-lightning causes
Probability of False Flash Type Identification	No more than 1% of all reported CL flashes shall be due to CG lightning or noise
Polarity	NA
Estimated Peak Current	NA
Strokes per Flash	NA
Data Delivery Time	Total time from the time the flash occurs to the time that flash is reported shall be 5 minutes or less for 99% of all flashes

TABLE 3-8
LIGHTNING DATA TECHNICAL REQUIREMENTS
GEOGRAPHIC ZONES 16 THROUGH 26
CLOUD LIGHTNING (CL)

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3.3. STATUS INFORMATION

With any lightning detection system, sensor or communication failures can result in a degradation of the data or a complete loss of data over specific areas or even over the entire network. The offeror shall furnish system status information to distinguish areas of no lightning activity from areas of degraded performance or lost data. This information shall be transmitted in a notice to each receiver site identified in Addendum 1. The notice shall identify areas where the specified performance requirements cannot be expected.

The offeror's system shall detect all network changes or outages which adversely affect the performance of the system. The expected impact of these changes shall be reported within two minutes from the time of the outage and repeated at least every ten minutes. These changes may be expected or unexpected. They may result from sensor, communications, or processor failures, or from planned maintenance. Other causes of outages include solar storms and the effect of solar eclipses on satellite communications. Expected outages shall be reported to the Government at least one week in advance except outages due to the effect of a solar eclipse on satellite communications shall be reported one month in advance and expected outages due to solar storms reported one day in advance. Systems degradation information shall include estimates of the resulting changes in detection capability and location accuracy. Any expected outages due to the effect of solar eclipse on satellite communications used to transmit lightning data shall also be reported. The outage message shall be repeated at least once a day until the outage is over.

See Section 7.6. for more information on outages.

4. GEOGRAPHIC COVERAGE REQUIREMENTS

The offeror shall offer coverage based on geographic zones. Twenty six zones have been defined covering all geographic areas of the earth. Section 4.1 identifies these zones and Appendix B contains a detailed description and maps of the zones.

The offeror shall also offer coverage of Zones 1,2, and 3 based on areas of several sizes and based on individual states. Section 4.2 describes these areas.

4.1. GEOGRAPHIC ZONES

The following sections describe the terrestrial and marine zones and the areal coverage of each zone.

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4.1.1. TERRESTRIAL ZONES

The offeror shall at a minimum offer CG data from Zone 1 (the base requirement). Zones 2-15 are optional zones. IL data for Zone 1 is also an option. The offeror need not offer data from Zones 2-15 unless the Government requires data from them.

Coverage for the terrestrial zones include coverage up to 250 km offshore and over adjacent land areas; except for Zones 1 and 2. Zone 1 will include coverage up to 500 km offshore and over adjacent land areas; and Zone 2 will include data from the Canadian network sufficient to provide coverage up to 200 nmi into Canada.

The terrestrial zones are defined in Table 4-1 and Appendix B contain maps and a detailed descriptions of these zones.

ZONE	AREA
Zone 1	Forty Eight Contiguous States, District of Columbia, Puerto Rico and the Virgin Islands
Zone 2	Alaska
Zone 3	Hawaii
Zone 4	Canada
Zone 5	Mexico
Zone 6	Central and South America
Zone 7	Europe
Zone 8	Northern Asia
Zone 9	Southern Asia
Zone 10	Middle East
Zone 11	Africa
Zone 12	East Indies and the Philippines
Zone 13	Australia and New Zealand
Zone 14	Greenland and Iceland
Zone 15	Antarctica

TABLE 4-1
TERRESTRIAL ZONES

4.1.2. MARINE ZONES

All 11 marine zones are optional zones. The offeror shall propose how it plans to meet the requirements for these zones. The marine zones are defined in Table 4-2 and Appendix B contains maps and detailed descriptions of these zones.

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ZONE	AREA
Zone 16	Gulf of Mexico, Caribbean Sea and West Indies
Zone 17	North Atlantic Ocean
Zone 18	South Atlantic Ocean
Zone 19	Mediterranean and Black Seas
Zone 20	Northeast Pacific Ocean
Zone 21	Northwest Pacific Ocean
Zone 22	Southeast Pacific Ocean
Zone 23	Southwest Pacific Ocean
Zone 24	Indian Ocean
Zone 25	Arctic Ocean
Zone 26	Southern Ocean

TABLE 4-2
MARINE ZONES

4.2. AREAL COVERAGE OPTIONS FOR ZONES 1, 2, AND 3

The offeror shall offer lightning data coverage for areas of several different sizes within Zones 1, 2 and 3. The locations of the areas will be defined by the Government agencies and centered on user sites. The Government will define the user sites. The Government may select any number of these areas for any part of Zones 1, 2 or 3. The offeror may offer these areas defined either as squares or circles. Table 4-3 defines these areas.

AREA	SQUARE SIZE	CIRCLE SIZE
Very Small Area	50 x 50 km	71 km diameter
Small Area	100 x 100 km	142 km diameter
Medium Area	500 x 500 km	708 km diameter
Large Area	1,000 x 1,000 km	1,415 km diameter

TABLE 4-3
AREAL COVERAGE OPTIONS FOR ZONES 1, 2, AND 3

The offeror will also offer lightning data coverage on a state by state basis for Zones 1. Coverage will not include any adjacent

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land or marine areas, except that bodies of water within the states and bodies of water between states will be included. Coverage over the US portions of the Great Lakes, Lake St. Clair, and the Lake of the Woods will also be included with the bordering states.

5. LEVEL II, III, IV AND V LIGHTNING DATA

Level I lightning data can be used to generate Level II, III, IV and V data. Descriptions of Government and Offeror-generated Level II, III, IV, and V data follows.

5.1. GOVERNMENT-GENERATED LEVEL III, IV AND V LIGHTNING DATA

The Government may generate Government-developed Level III, IV and V data based wholly or partially on the offeror's lightning data. The content of these data will be determined by the Government. These data will be used operationally and as a source of data for research purposes.

5.2. OFFEROR-GENERATED LEVEL II LIGHTNING DATA

The offeror may make available to the Government Level II lightning data. These data shall be offered as options that the Government may or may not elect to procure. Offeror-supplied Level II data shall be used only by the participating agencies and cooperating organizations and will not be redistributed beyond the participating agencies and cooperating organizations.

6. ARCHIVED DATA

Archived lightning data is any lightning data more than 24 hours old. Archived data may be in hardcopy or electronic form.

6.1. LEVEL I AND II DATA

The offeror may archive Level I and II data in the form it is transmitted to the Government and in a quality controlled form. If the offeror elects not to archive Level I data in the as transmitted form, the Government reserves the right to archive the data. If the offeror does archive Level I data in the as transmitted form the Government will not archive the same data. The Government will not archive Level II data.

6.2. LEVEL III, IV AND V DATA

The Government reserves the right to archive Level III, IV, and V data.

6.3. OFFEROR'S ARCHIVE

The offeror shall state the length of time lightning data is retained in its archive. If the offeror plans to dispose of any

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data from its archive, the offeror shall offer the data to the Government before disposing of it.

The offeror shall make archived data available on CDs for each geographic zone on a monthly basis. Government agencies will not distribute these CD beyond the agency procuring them except that CDs may be distributed to organizations with cooperative agreements.

6.4. GOVERNMENT ARCHIVE

The Government may archive data in individual agency archives, at the user and receiver sites, or in the permanent national archive at NOAA's National Climatic Data Center (NCDC).

7. DATA/PRODUCT DELIVERY

The offeror shall deliver lightning data to the Government as a continuous data stream. User sites in some agencies will receive the data directly from the offeror. Other agencies will receive the lightning data at a central location and redistribute it to the authorized users.

7.1. KEEP ALIVE MESSAGE

During periods with no observed lightning activity the offeror shall transmit a "keep alive" message indicating that no lightning is occurring throughout the zone. This message is necessary to inform the users that the lack of reported lightning is not due to a failure in the lightning detection network or communications.

7.2. DELIVERY METHODS

Several ways to receive lightning data are described in Sections 7.2.1. through 7.2.3. Government agencies may select the method that best meets their needs.

7.2.1. NOAAPORT

NOAA will receive Level I lightning data from the offeror at the NWS Telecommunication Gateway (NWSTG). From there either CG or IL Level III, IV, or V data will be produced and disseminated in near real-time via the NOAAPORT Satellite Broadcast. Level I data may also be disseminated through NOAAPORT. The NOAAPORT broadcast is intended to meet NOAA's operational needs, but other users authorized under this SOW may also receive lightning products and data through NOAAPORT.

Lightning data transmitted through NOAAPORT will be encrypted so that unauthorized users may not use them.

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7.2.2. DATA STREAMING

The offeror shall deliver lightning data from Zones 1, 2 and 3 to the Government agencies in a continuous data stream. Data from the other zones (Zones 4-26) shall be delivered in 5 minutes or less. In some agencies this data will be received at receiver sites and redistributed to the user sites. In other agencies the data will be received directly from the offeror at the user sites. See the subsections under 7.3 for definitions of receiver and users sites.

Lightning data distributed in a data stream will be transmitted through a secure link to prevent their use by unauthorized users.

7.2.3. INTERNET ACCESS

The offeror shall provide an alternate delivery system for Level I Data using the internet for Level I data. This delivery system may be used as a redundant delivery method that could be used if the primary delivery system fails.

The offeror will also provide a display ready internet product displaying lightning data. This product will be developed to meet Government needs for a product that can be used by cooperating organizations that need limited access to lightning data.

Internet access will be an option that the Government agencies may choose to procure.

7.3. RECEIVER SITES AND USERS SITES

The sections 7.3.1 through 7.3.3. describe receiver and user sites and the relationship between the two.

7.3.1. RECEIVER SITES

A receiver site is a location receiving lightning data either directly from the offeror through a third-party contractor. In general, a receiver site is the first entry point into an agency. Government-generated Level III, IV, and V data may be produced at receiver sites for dissemination to user sites. The total number of receiver sites will be identified in the completed lightning data task orders as shown in Appendix D.

7.3.2. USER SITES

User sites are locations, not necessarily located with receiver sites, using lightning data. User sites are the operational units using the lightning data, not individual work stations. Example - A NWS Weather Forecast Office is a user site but each individual forecaster's work position would not be. The use may be for operational purposes, research or testing. The total

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number of user sites will be identified in the completed lightning data task orders.

7.3.3. RELATIONSHIP BETWEEN RECEIVER AND USER SITES

Receiver sites disseminate lightning data to user sites. A receiver site may also use the data itself. In this case the location is both a receiver site and user site. Appendix E outlines the relationship between the receiver and users sites in a graphical format.

7.4. RECEIVER SITE EQUIPMENT

The following sections describe the requirements for receiver site equipment and communications

7.4.1. GOVERNMENT-FURNISHED EQUIPMENT

The Government reserves the right to develop and interface Government-furnished equipment with the offeror's lightning data stream.

7.4.1.1. GOVERNMENT RECEIVER AND DISPLAY EQUIPMENT

Government agencies may use Government-owned and operated receiver and display equipment at their receiver and users sites. If a Government agency uses offeror-furnished communications with Government-supplied receiver and display equipment, the offeror shall interface the data stream directly into the Government's equipment and validate its proper operation.

7.4.1.2. GOVERNMENT COMMUNICATIONS LINKS

Government agencies may use Government supplied communications links to transmit data from the offeror's facility to the receiver sites. These links will connect the offeror's facility with the Government receiver site. The offeror shall input the lightning data stream directly into the Government's communication link. The offeror shall supply the Government with the technical requirements of a link capable of handling the offeror's data stream and any assistance needed to successfully implement the connection.

7.4.1.3. GOVERNMENT SOFTWARE

Government agencies reserve the right to use Government-supplied software at their receiver and users sites. The offeror shall provide the Government documentation describing data processing algorithms necessary to decode and unpack the offeror's data stream and to display the data. This will allow the Government to process and display the data using Government supplied software.

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7.4.2. OFFERER-FURNISHED EQUIPMENT

The following sections describe the requirement for offeror-supplied display and receiver equipment and communications.

7.4.2.1. OFFEROR-SUPPLIED RECEIVER AND DISPLAY EQUIPMENT

The offeror shall offer as an option receiver and display equipment. This equipment shall be capable of receiving the data stream and displaying it. At a minimum the display equipment shall be capable of:

1. Plotting lightning strikes as they are received.
2. Color coding the strikes so that the time of occurrence of the strike can be identified.
3. Use symbols and/or colors to denote the polarity of the strikes.
4. Use symbols and/or colors to indicate the type of lightning (CG or CL).
5. Displaying background maps with accuracies preserving the data stream. These maps will include at a minimum state and county boundaries, major roads, major bodies of water, and major cities.
6. Zooming any area selected by Government personnel.
7. Producing hard copies of all data and graphics selected by Government personnel.
8. Plotting and updating loops of lightning strike locations as they are received. Loops shall include at least 6 hours of data.

The offeror shall provide detailed documentation describing clearly the installation and operation of the receiver and display equipment. In addition the offeror shall provide necessary training to Government onsite staff in the use of the receiver and display equipment.

7.4.2.2. OfferorSUPPLIED COMMUNICATIONS LINKS

The offeror shall offer, as an option, a communications link between its facility and the Government receiver sites. This link shall be capable of transmitting the offeror's lightning data stream to the receiver sites within the time specified in Table 3-1 through 3-8. At receiver sites not using offeror

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supplied equipment the communications link shall be capable of ingesting the offeror's data stream directly into the Government's equipment.

7.4.2.3. OFFEROR SOFTWARE

The offeror shall offer, as an option software capable of displaying the lightning data stream as specified in Section 7.4.2.1. The Government may use Government supplied equipment meeting the system requirements defined by the offeror to run the offeror supplied software.

The offeror shall provide, at no cost to the Government, telephone technical support for the offeror-supplied software for a period of one year from that date of the software's acceptance by the Government. Technical support shall be 24 hours a day seven days a week. Support includes trouble shooting problems and all software upgrades made to correct identified problems.

7.5. DATA FORMAT

The following sections describe the types of formats authorized under this SOW.

7.5.1. OFFEROR-SUPPLIED DATA STREAM

The offeror shall provide the Government a detailed description of the format used with the offeror's streaming data. The description will be detailed enough to allow the Government to ingest and decode the data into any Government system, application, or numerical model.

7.5.2. NOAAPORT ONE MINUTE PRODUCT

The formats of NOAA's 1-minute CG product are shown in Appendix F.

7.5.3. INTERNET FORMAT

The offeror shall provide a detailed description of the data format used with the offeror's internet dissemination. The description will be detailed enough to allow the Government to ingest and decode the data into any Government system, application, or numerical model.

7.5.4. DATA ENCRYPTION

The offeror shall provide the means of encryption used to ensure that unauthorized users cannot access the lightning data.

7.5.5. HEARTBEAT

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The offeror shall add heartbeat packets to the data stream whenever 60 seconds have elapsed without receipt of a data packet.

7.6. AVAILABILITY AND RELIABILITY

The offeror's lightning detection network shall operate and transmit data to the Government agencies 24 hours a day, seven days a week. Availability is defined as data being received by the receiver sites within the time defined in Table 7-1 through 7-8. Any failure, regardless of the length of time, of either the detection network or of the offeror's communication system resulting in a loss of availability is defined as a system outage.

Systems outages at any receiving site shall not occur for more than 72 cumulative hours over a 12 month period. Of this time no more than 24 hours shall occur during any 30-day period.

The offeror shall grant credits to the Government against the monthly recurring charges whenever:

1. The system outages exceed a total of 72 hours over any 12 month period.

or

2. The system outages exceed 24 hours over the previous 30 day period.

Periods of system outage shall be figured to the nearest hour increment. Credits shall be calculated on a prorated basis using a 30 day month and applied to the monthly billing period. The following equation will be used to calculate credits:

$$\text{Credit (per Site per Month)} = \frac{(\text{Unit Cost})(\text{Hours of Outage})}{(720)}$$

The offeror shall designate a 24 hour-a-day, seven days-a-week point of contact for system problems. The offeror shall initiate corrective action within six hours of receiving a report of a problem.

The offeror shall provide stable network operation, communications, and data display for the entire life of the contract. If the offeror independently makes any modification to its system effecting the lightning data received by the Government, the offeror shall provide, cost-free to the

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Government, any hardware or software necessary to insure continuous receipt of data by the government.

The offeror shall monitor the operation of its system 24 hours a day, seven days a week and notify the user agencies and the Contracting Officers Technical Representative (COTR) of any system outages or significant changes. System outages include maintenance (scheduled or unscheduled) or any change implementation requiring the detection network or communications to be out of service. Planned outages shall be announced at least two weeks in advance. Unplanned outages shall be announced as soon as possible after the offeror becomes aware of the outage. This information is necessary to inform Government users of apparent changes in lightning activity due to changes in the performance of the offeror's lightning detection network or communications.

7.7. REDISTRIBUTION RIGHTS

The following sections describe the rights of the Government to redistribute lightning data.

7.7.1. REDISTRIBUTION OF REAL-TIME DATA

1. Level I, II, III, and IV Data - Government may redistribute Level I, II, III, and IV Data to any participating agencies and to any organization with which a participating agency has a cooperative or working arrangement. Organizations that may receive data include other Government agencies (federal, state, and local), contractors, and other cooperating organizations. Data may be distributed to organizations in foreign countries with which cooperative arrangements have been established. Data may be included in scientific papers or journal articles. Internet redistribution is allowed to participating agencies through secure internet connections that deny access to unauthorized organizations or individuals.
2. Level V Data - Government may freely distribute the Level V Data to any user.

7.7.2. REDISTRIBUTION OF ARCHIVED DATA

1. Level I Data - If level I data is archived at NCDC (see Section 6.1) it may be disseminated to the participation agencies and to any other organization that request the products through a participating agency.

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Participating agencies may disseminate archived Level I data to the agencies included in the contract and to cooperating organizations.

Internet redistribution is allowed to participating agencies through secure internet connections that deny access to unauthorized organizations or individuals.

2. Level II Data - NCDC will not archive or disseminate Level II data.

Participating agencies may disseminate archived Level II data to the agencies included in the contract and to cooperating organizations.

Internet redistribution is allowed to participating agencies through secure internet connections that deny access to unauthorized organizations or individuals.

3. Level III and IV Data - NCDC may redistribute archived Level III and IV data participation agencies and to any other organization that request the products through a participating agency.

Participating agencies may disseminate archived Level III and IV Data to the agencies included in the contract and to cooperating organizations.

Internet redistribution is allowed to participating agencies through secure internet connections that deny access to unauthorized organizations or individuals.

4. Level V Data - NCDC and participating agencies and may freely distribute the archived Level V Data to any user.

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APPENDIX A - TERMS OF REFERENCE

Archived Data ... Any lightning data or products generated from that data older than 24 hours. Archived data may be in hardcopy or electronic form.

Cloud Lightning (CL) ... Lightning not striking the ground. It includes in-cloud, cloud to cloud, and cloud to air Lightning.

Cloud to Air Lightning ... Lightning that originates in a cloud and travels through the air but does not enter another cloud or strike the ground.

Cloud to Cloud Lightning ... Lightning that originates in a cloud and travels to another cloud.

Cloud to Ground Lightning (CG) ... Lightning that originates in a cloud and strikes the ground or some natural or man-made feature on the ground.

Contracting Entity ... An organization that has a contract with one or more of the sponsoring agencies to perform a task for the Government. The task may involve operational use of lightning data or research.

CONUS ... The 48 contiguous states and District of Columbia.

Cooperating Organization ... An organization that has a working relationship with one or more of the participating agencies. Cooperating organizations can be government agencies (federal, state, or local) or non-governmental organizations.

Government ... Unless otherwise noted, the term "Government" in this SOW refers to the Federal Government.

In-Cloud Lightning ... A lightning stroke that is confined to the cloud where it originated.

Integrated Lightning (IL) ... Lightning that includes cloud to ground, in-cloud, cloud to cloud, and cloud to air lightning.

Level I Lightning Data ... Streaming data as received from the vendor, unaltered in anyway.

Level II Lightning Data ... Offeror-generated products containing lightning data.

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Level III Lightning Data ... Government generated products repackaging lightning data. The data is unchanged in content but is formatted differently than the Level I data. No data other than lightning data is included in the product but the entire Level I data stream need not be included in a level II product.

Level IV Lightning Data ... Government value-added products which integrate lightning data along with other types of data to generate a new product. The new product identifies detected or areas of lightning.

Level V Lightning Data ... Government generated products using lightning data as an input but not displaying detected lightning or areas of lightning.

Lightning Stroke ... A lightning stroke is a leader and the return stroke.

Lightning Flash ... A lightning flash is the combination of two or more strokes.

Offeror... The company that will supply lightning data to the Federal Government under this SOW.

Participating Agency ... A Federal Government agency that is covered by the lightning data contract. Participating agencies are identified in the contract.

Receiver Site ... A location that receives lightning data or products containing lightning data either directly from the vendor or through a third party contractor. Location that receive the NWS produced lightning product through NOAAPORT are also receiver sites.

Sponsoring Agency ... A Federal Government agency covered by this SOW that procures lightning data from the offeror.

Third Party Contractor ... A contractor receiving lightning data from the offeror and retransmitting it to the Federal Government agency covered by this SOW. The third party contractor does not use the lightning data itself but acts as a communications company.

A third part contractor may also generate lightning products for the Government agency.

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User Site ... User sites are locations, not necessarily located with receiver sites, using lightning data. User sites are the operational units using the lightning data, not individual work stations.

United States ... The 50 states, District of Columbia, Puerto Rico, and the Virgin Islands,.

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APPENDIX B - GEOGRAPHIC COVERAGE MAPS

The vendor shall provide lightning data from up to 26 geographic zones. Zone 1 is the basic requirement. The vendor shall offer lightning data from this zone. The other zones are options. The vendor is required to offer data from an optional zone only if an agency requests data from the zone. The vendor shall offer data for portions of Zone 1 as well as for the entire zone. A description of these zones follows. A series of maps showing these zones begins on page B-15.

ZONE 1 - FORTY EIGHT CONTIGUOUS STATES AND PUERTO RICO		
<u>AREAS COVERED - COVERAGE EXTENDS 500 KM OFFSHORE/OVER ADJACENT LAND AREAS</u>		
<ul style="list-style-type: none">- United States (48 Contiguous States)- Puerto Rico		
Agencies may choose to receive data from the entire zone or from smaller areas within the zone. The smaller areas are described below.		
AREA	AREA SIZE (AREA MAY BE DEFINED EITHER BY A SQUARE OR CIRCLE)	
	SQUARE SIZE	CIRCLE SIZE
Very Small Area	50 x 50 km	71 km Diameter
Small Area	100 x 100 km	142 km Diameter
Medium Area	500 x 500 km	708 km Diameter
Large Area	1,000 x 1,000 km	1,415 km Diameter
Individual State	Areas Defined by State Boundaries; One Area for Each State	

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ZONE 2 - ALASKA		
<u>AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE AND 200 NMI OVER ADJACENT AREAS OF CANADA</u>		
- Alaska		
Agencies may choose to receive data from the entire zone or from smaller areas within the zone. The smaller areas are described below.		
	AREA SIZE (AREA MAY BE DEFINED EITHER BY A SQUARE OR CIRCLE)	
	SQUARE SIZE	CIRCLE SIZE
Very Small Area	50 x 50 km	71 km Diameter
Small Area	100 x 100 km	142 km Diameter
Medium Area	500 x 500 km	708 km Diameter
Large Area	1,000 x 1,000 km	1,415 km Diameter
ZONE 3- HAWAII		
<u>AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE</u>		
- Hawaii		
Agencies may choose to receive data from the entire zone or from smaller areas within the zone. The smaller areas are described below.		
	AREA SIZE (AREA MAY BE DEFINED EITHER BY A SQUARE OR CIRCLE)	
	SQUARE SIZE	CIRCLE SIZE
Very Small Area	50 x 50 km	71 km Diameter
Small Area	100 x 100 km	142 km Diameter
Medium Area	500 x 500 km	708 km Diameter
Large Area	1,000 x 1,000 km	1,415 km Diameter
ZONE 4 - CANADA		
<u>AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS</u>		
- Canada - Hudson Bay - Gulf of St. Lawrence - Ungava Bay		

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ZONE 5 - MEXICO
AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS
<ul style="list-style-type: none"> - Mexico - Sea of Cortez (Gulf of California)
ZONE 6 - CENTRAL AND SOUTH AMERICA
AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS
<ul style="list-style-type: none"> - Argentina - Belize - Bolivia - Brazil - Chile (Excluding Easter Island) - Colombia - Costa Rica - Ecuador (Excluding Galapagos Islands) - El Salvador - French Guiana - Guatemala - Guyana - Honduras - Nicaragua - Panama - Paraguay - Peru - Suriname - Uruguay - Venezuela

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ZONE 7 - EUROPE

AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS

- Albania
- Andorra
- Austria
- Belarus
- Belgium
- Bosnia - Herzegovina
- Bulgaria
- Croatia
- Czech Republic
- Denmark (Excluding Faeroe Islands and Greenland)
- Estonia
- Finland
- France (Including Corsica)
- Germany
- Gibraltar
- Greece (Including Greek Isles)
- Hungary
- Ireland
- Italy (Including Sardinia, Sicily, and Aeolian Islands)
- Latvia
- Liechtenstein
- Lithuania
- Luxembourg
- Macedonia (Republic of)
- Moldova
- Monaco
- Netherlands
- Norway (Excluding Jan Mayen and Svaldbard Islands)
- Poland
- Portugal (Excluding Azores and Madeira Islands)
- Romania
- San Marino
- Serbia and Montenegro (Including Kosovo)
- Slovakia
- Slovenia
- Spain (Including Balearic Islands; Excluding Canary Islands)
- Sweden
- Switzerland
- Ukraine
- United Kingdom
- Vatican City
- Baltic Sea
- North Sea

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ZONE 8 - NORTHERN ASIA
AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS
<ul style="list-style-type: none"> - Armenia - Azerbaijan - Georgia - Japan (Excluding Bonin, Ryukyu, and Volcano Islands) - Kazakhstan - Kyrgyzstan - Mongolia - North Korea - Russia - South Korea - Tajikistan - Turkmenistan - Uzbekistan
ZONE 9 - SOUTHERN ASIA
AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS
<ul style="list-style-type: none"> - Afghanistan - Bangladesh - Bhutan - Cambodia - China (Including Hong Kong and Macau) - India (Excluding Andaman and Nicobar Islands) - Laos - Myanmar (Burma) - Nepal - Pakistan - Sri Lanka - Taiwan - Thailand - Vietnam
ZONE 10 - MIDDLE EAST
AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS
<ul style="list-style-type: none"> - Bahrain - Iran - Iraq - Israel - Jordan - Kuwait - Lebanon - Oman - Palestinian Territory (Gaza Strip and West Bank) - Qatar - Saudi Arabia - Syria - Turkey - United Arab Emirates - Yemen

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ZONE 11 - AFRICA

AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS

- Algeria
- Angola
- Benin
- Botswana
- Burkina Faso
- Burundi
- Cameroon
- Central African Republic
- Chad
- Congo (Democratic Republic of)(Formerly Zaire)
- Congo (Republic of)
- Cote d' Ivoire
- Djibouti
- Egypt
- Equatorial Guinea
- Eritrea
- Ethiopia
- Gabon
- Gambia
- Ghana
- Guinea
- Guinea-Bissau
- Kenya
- Lesotho
- Liberia
- Libya
- Madagascar
- Malawi
- Mali
- Mauritania
- Morocco
- Mozambique
- Namibia
- Niger
- Nigeria
- Rwanda
- Sao Tome and Principe
- Senegal
- Sierra Leone
- Somalia
- Sudan
- Swaziland
- Tanzania
- Togo
- Tunisia
- Uganda
- Western Sahara
- Zambia
- Zimbabwe

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ZONE 12 - EAST INDIES AND THE PHILIPPINES
<u>AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS</u>
<ul style="list-style-type: none"> - Brunei - East Timor - Indonesia - Malaysia - Papua New Guinea - Philippines - Singapore - Solomon Islands
ZONE 13 - AUSTRALIA AND NEW ZEALAND
<u>AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS</u>
<ul style="list-style-type: none"> - Australia - New Zealand
ZONE 14 - GREENLAND AND ICELAND
<u>AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS</u>
<ul style="list-style-type: none"> - Greenland - Iceland
ZONE 15 - ANTARCTICA
<u>AREAS COVERED - COVERAGE EXTENDS 250 KM OFFSHORE/OVER ADJACENT LAND AREAS</u>
<ul style="list-style-type: none"> - Antarctica (Including all Islands South of 60S)
ZONE 16 - GULF OF MEXICO, CARIBBEAN SEA AND WEST INDIES
<u>AREAS COVERED - MARINE AREAS</u>
<ul style="list-style-type: none"> - Caribbean Sea - Gulf of Mexico - Coverage includes all islands within the zone except Puerto Rico and the Virgin islands
ZONE 17 - NORTH ATLANTIC OCEAN
<u>AREAS COVERED - MARINE AREAS</u>
<ul style="list-style-type: none"> - Atlantic Ocean (Equator to 60N) - Baltic Sea - North Sea - Gulf of St. Lawrence - Ungava Bay - Coverage includes all islands within the zone except Newfoundland and islands in the Gulf of St. Lawrence

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ZONE 18 - SOUTH ATLANTIC OCEAN
<u>AREAS COVERED - MARINE AREAS</u> <ul style="list-style-type: none"> - Atlantic Ocean (Equator to 60S) - Coverage includes all islands within the zone
ZONE 19 - MEDITERRANEAN AND BLACK SEAS
<u>AREAS COVERED - MARINE AREAS</u> <ul style="list-style-type: none"> - Black Sea - Mediterranean Sea - Adriatic - Aegean - Sea of Azov - Ionian Sea - Sea of Marmara - Tyrrhenian Sea - Coverage includes all islands within the zone
ZONE 20 - NORTHEAST PACIFIC OCEAN
<u>AREAS COVERED - MARINE AREAS</u> <ul style="list-style-type: none"> - Pacific Ocean (Equator to 60N, East of 180 Degrees) - Gulf of Alaska - Bering Sea (Southeast Portion) - Sea of Cortez (Gulf of California) - Coverage includes all islands within the zone except the Hawaiian Islands
ZONE 21 - NORTHWEST PACIFIC OCEAN
<u>AREAS COVERED - MARINE AREAS</u> <ul style="list-style-type: none"> - Pacific Ocean (Equator to 60N, West of 180 Degrees) - Bering Sea (Southwest Portion) - East China Sea - Sea of Japan - Sea of Okhotsk - Philippine Sea - South China Sea - Gulf of Thailand - Yellow Sea - Coverage includes all islands within the zone except Sakhalin, Japan, Taiwan, Hainan, the Philippines and East Indies
ZONE 22 - SOUTHEAST PACIFIC OCEAN
<u>AREAS COVERED - MARINE AREAS</u> <ul style="list-style-type: none"> - Pacific Ocean (Equator to 60S, East of 180 Degrees) - Coverage includes all islands within the zone

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ZONE 23 - SOUTHWEST PACIFIC OCEAN
<p><u>AREAS COVERED - MARINE AREAS</u></p> <ul style="list-style-type: none"> - Pacific Ocean (Equator to 60S, West of 180 Degrees) - Coral Sea - Tasman Sea - Coverage includes all islands within the zone except New Zealand, Tasmania, and East Indies
ZONE 24 - INDIAN OCEAN
<p><u>AREAS COVERED - MARINE AREAS</u></p> <ul style="list-style-type: none"> - Indian Ocean (North of 60S) - Arabian Sea - Bay of Bengal - Gulf of Oman - Persian Gulf - Red Sea - Timor Sea - Coverage includes all islands within the zone except Sri Lanka and Madagascar
ZONE 25 - ARCTIC OCEAN
<p><u>AREAS COVERED - MARINE AREAS</u></p> <ul style="list-style-type: none"> - Arctic Ocean (Marine Areas North of 60N) - Baffin Bay - Beaufort Sea - Berents Sea - Bering Sea (North of 60N) - Davis Strait - Labrador Sea - Norwegian Sea - Coverage includes all islands within the zone except Greenland, Iceland, and Canadian and Russian Islands in the Arctic Ocean
ZONE 26 - SOUTHERN OCEAN
<p><u>AREAS COVERED - MARINE AREAS</u></p> <ul style="list-style-type: none"> - Southern Ocean (Marine Areas South of 60S) - Amundsen Sea - Bellingshausen Sea - Ross Sea (Including Ross Ice Shelf) - Waddell Sea (Including Ronne Ice Shelf) - Coverage includes all islands within the zone

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APPENDIX C - SERVICES RENDERED BY THE LIGHTNING DATA OFFERER

BASE REQUIREMENTS

THE OFFEROR SHALL MEET ALL OF THE BASE REQUIREMENTS

Lightning Data

- Geographic Zone 1
- Lightning Type CG
- Detection Efficiency 90% (60% Off Shore)
- Area Sizes Entire Zone
 - . Very Small Areas
 - . Small Areas
 - . Medium Areas
 - . Large Areas
 - . Individual States

Access to data from the offeror's archive (Section 6.3)

Notification of Government agencies of periods of systems outages or degraded operation (Section 3.3)

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OPTIONAL SERVICES

**THE OFFEROR MUST PROVIDE THE OPTIONAL SERVICES ONLY IF A GOVERNMENT AGENCY
REQUIRES THE SERVICE**

Lightning Data - Geographic Zone 1 - Lightning Type CL - Detection Efficiencies ... 5%, 10%, 20%, 50%, 90% - Area Size Entire Zones
Lightning Data - Geographic Zones 2-3 - Lightning Type CG - Detection Efficiency 80% - Area Size Entire Zones
Lightning Data - Geographic Zones 2-3 - Lightning Type CL - Detection Efficiencies ... 5%, 10%, 20%, 60% - Area Size Entire Zones
Lightning Data - Geographic Zones 4-15 - Lightning Type CG - Detection Efficiency 60% - Area Size Entire Zones
Lightning Data - Geographic Zones 4-15 - Lightning Type CL - Detection Efficiencies ... 5%, 10%, 20%, 60% - Area Size Entire Zones
Lightning Data - Geographic Zones 16-26 - Lightning Type CG - Detection Efficiency 20% - Area Size Entire Zones
Lightning Data - Geographic Zones 16-26 - Lightning Type CL - Detection Efficiency 5%, 10%, 20% - Area Size Entire Zones
Internet data delivery (Section 7.2.3)
Communication Link between offeror and Government receiver sites (Section 7.4.2.2.)

OPTIONAL SERVICES

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**THE OFFEROR MUST PROVIDE THE OPTIONAL SERVICES ONLY IF A GOVERNMENT AGENCY
REQUIRES THE SERVICE**

Offeror generated lightning products and applications (Section 5.2)
Access to data and products from the offerors' archive (Section 6.3)
Display equipment (Section 7.4.2.1.)
Receiver equipment (Section 7.4.2.1.)
On-site training on the operation offeror's receiver and display equipment (Section 7.4.2.1.)
Display Software (Section 7.4.2.3.)
Technical Support (Section 7.4.2.3.)

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APPENDIX D - EXAMPLE OF A TASK ORDER

...(Name of Agency)...

INITIAL TASK ORDER

GOVERNMENT AGENCY
<u>AGENCY NAME, ADDRESS, AND POINT OF CONTACT</u> Point of Contact ... Title Organization Phone Email
SERVICE OPTIONS
<u>TYPE OF LIGHTNING DATA REQUIRED</u> Integrated Lightning (IL)(Includes Cloud to Ground, Cloud to Cloud, Cloud to Air, and In-Cloud Lightning) Cloud to Ground Lightning (CG) Only
<u>DATA DELIVERY METHOD REQUIRED</u> NOAAPORT feed of lightning data from Zones 1, 2, and 3 Offerorsupplied streaming data with offerorsupplied receiver and display equipment; Data may be received directly from the vendor or through a third party contractor Offerorsupplied streaming data with Government supplied receiver and display equipment; Data may be received directly from the vendor or through a third party contractor
AGENCY USES OF LIGHTNING DATA
<u>WARNING AND FORECASTING</u> Public (Including Severe Weather) Marine Aviation Hydrological Tropical Fire Weather Wildland Fire Onset Meteorological Numerical Model Ingest/Initialization Transport and Diffusion Models Guidance Products Warnings for Military Bases

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OPERATIONS AND SAFETY

Pre-Flight Briefings
Ground Operations (Refueling, Maintenance, etc.)
Aircraft Takeoff/Landing
Aircraft Enroute
Homeland Security
Troop Maneuvers/Marches
Aircraft Arming
Weapons Launch Criteria
Provides "T" to Indicate Thunderstorm Occurrence in ASOS/AWOS Observations
Space Shuttle Operations (Launch, Re-entry, Landing, Transport)
Launch Criteria for Unmanned Spacecraft
Protection of Surface Facilities at Kennedy Space Flight Center

RESEARCH AND TESTING

Validation of Space Based Lightning Mapping Satellites
Ground Truth to Improve Lightning Forecasting Methods
Case Studies
Testing Systems, Propellents, Communications, Munitions, etc.)
Testing New Lightning Protective Gear
Wildland Fire Research
Development of New Lightning Detection Systems and Equipment
Applications Development

ASSESSMENTS AND STUDIES

Damage Assessments
Climatic Studies

GOVERNMENT SYSTEMS REQUIRING LIGHTNING DATA

AWIPS
N-AWIPS
MCIDAS
ADAS/ITWS
ASOS/AWOS (ALDARS)
IAMS
IMETS
AFS
OASIS
JAAWIN
WARP
ETMS
4DWX
OfferorSupplied System
Local Display System

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GOVERNMENT AGENCY'S REQUIREMENT FOR ARCHIVED DATA	
No Archive Requirement Access to Offeror Archive NCDC Archive Agency Archive	
AGENCY PLANS FOR REDISTRIBUTION OF LIGHTNING DATA THROUGH THE INTERNET	
No Redistribution Planned ... If agency will distribute lightning data to through the internet, distribution is described here...	
RECEIVER AND USER SITES	
<u>RECEIVER SITES</u>	<u>NUMBER OF SITES</u>

Total Number of Receiver Sites	
<u>USER SITES</u>	<u>NUMBER OF SITES</u>

Total Number of User Sites	
GEOGRAPHIC COVERAGE REQUIREMENTS	
<u>TERRESTRIAL ZONES</u>	<u>MARINE ZONES</u>
Zone 1	Zone 16
Zone 2	Zone 17
Zone 3	Zone 18
Zone 4	Zone 19
Zone 5	Zone 20
Zone 6	Zone 21
Zone 7	Zone 22
Zone 8	Zone 23
Zone 9	Zone 24
Zone 10	Zone 25
Zone 11	Zone 26
Zone 12	
Zone 13	
Zone 14	
Zone 15	

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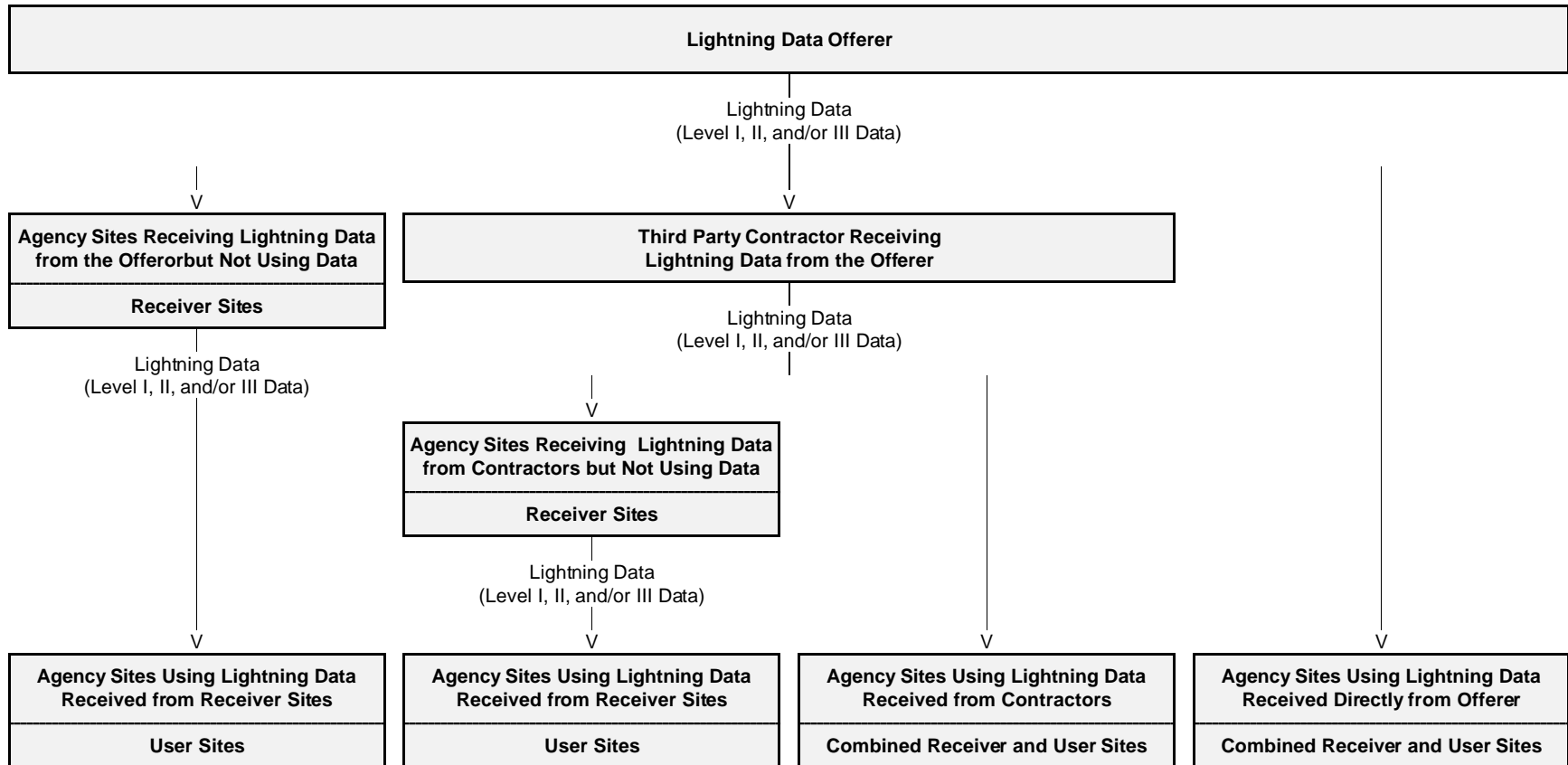
COMMUNICATIONS

...(Communications Block Diagram here)...

CERTIFICATION
I certify this task order accurately reflects the ...(name of agency)... initial task order for lightning data
Name: _____
Title: _____
Signature: _____
Date: _____

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APPENDIX E - RECEIVER AND USER SITES



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APPENDIX F - DATA FORMATS USED WITH THE ONE MINUTE NOAAPORT PRODUCT

Data will be provided at a later date.

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